Why People Drop Dead From Heart Failure

The Shocking Swiftness of Mrs. George Gould's Sudden End Draws Attention to the Score of "Heart Diseases" Most of Which May Be Discovered and Guarded Against; But Not All

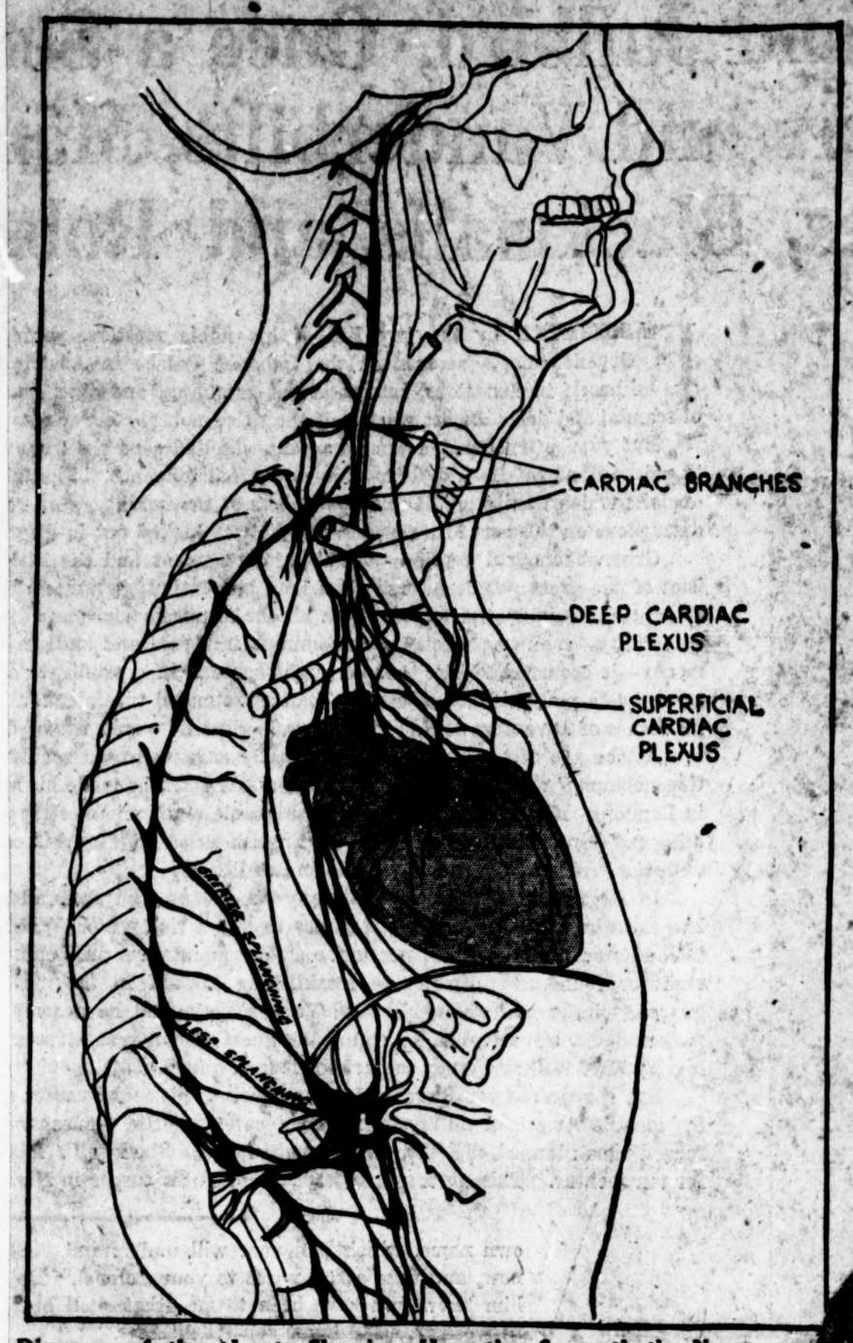
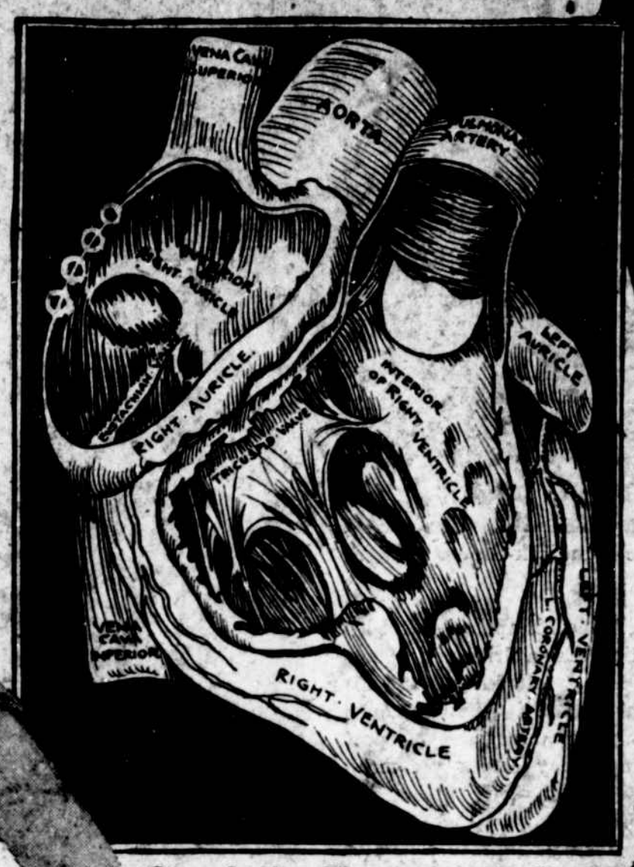


Diagram of the Heart, Showing How the Sympathetic Nerve System Carries Sensation from the Heart to the Chest and Other Regions and in This Way Ailments of the Heart Were Disguised and the Symptoms Were Misinterpreted as Indicating Indigestion or Other Derangements.



Cross Section Diagram of the Heart With Its Valves, etc., Which Are Referred to by Dr. Nascher in His Article.

Photograph of Mrs. George Gould, Showing Tiara of Jewels and Some of Her Famous Pearls Which Her Indulgent Husband Delighted to See Her Wear.

More Recent Photograph of Mrs. George Gould in Her Uniform as a War Worker.

Diagram of the Blood Circulation, Showing the Heart as the Great Pump in the Center.

By Dr. I. L. Nascher,
(Author of "Geriatrics, the Diseases of Old Age, and Their Treatment.")

WHEN the American public opened the morning newspapers on a recent Monday morning an unexpected piece of news shocked them.

The amiable, worthy, kind-hearted, philanthropic wife of George J. Gould, the well-known New York millionaire, had dropped dead at her husband's side. They were playing golf on Mr. Gould's private golf course at Lakewood, N. J. Standing side by side, Mrs. Gould swung and drove the little golf ball. Mr. Gould watched the flight of the ball for perhaps half a minute and then turning with a smile to his wife—saw her crumpled figure lying beside him on the ground.

Without warning, without time to utter a word or even a murmur, Mrs. Gould's heart had stopped and instantaneously ended her life.

Many a wounded soldier has been shot through the heart or through the brain and still retained a fragmentary moment of mental or bodily activity, to utter a final word or two before all was ended.

What is it that happened to the wife of the New York millionaire which without warning brought on her death with such incredible swiftness?

The vague term, "heart disease," covers a large range of ailments, some of which are painful, but of little consequence, and some of which are painless, but exceedingly dangerous. And while the trained ear of the specialist is able to detect many defects of the heart in time to warn of the consequences, yet there are enfeebled conditions of the human heart which give no premonitory signs whatever. Death hovers about unseen, unsuspected.

The most serious feature of some varieties of heart disease is this absence of symptoms until sudden death ensues. There are, indeed, some symptoms in almost every case, but as these are often only annoying and not distressing, lasting but a moment, and apparently not connected with the heart, they are usually neglected or overlooked.

In some of the twenty or more kinds of heart diseases there is a change in the myocardium, or heart muscle, in the endocardium or heart lining, in the valves or in the blood vessels of the heart, or in the pericardium or bag surrounding the heart. These are called organic heart diseases.

In the so-called functional heart diseases the heart does not work right, but no change in the organ has been found. The heart works too fast or too slow or irregularly, it beats too hard and causes the sensation of palpitation, or it beats too weak and there is an occasional sense of faintness, or parts of the heart do not work in harmony, one part working faster than another.

The tobacco heart, for example, is a functional or nervous heart disease. There is palpitation and irregularity of heart action, but no change in the heart structure to account for the impairment of function.

The human heart is really a pump. If we look at a beef heart, which is identical in construction with the human heart, we see that one side, the left as it lies in the body, is very much larger and thicker than the right. Each side has two chambers or cavities, the upper, called the auricle, separated from the lower, the ventricle, by a valve; the tricuspid valve on the right and the mitral valve on the left side. There is also a valve, the pulmonary valve, separating the right ventricle from the pulmonary artery which goes to the lungs, and the aortic valve, which separates the left ventricle from the aorta, the big artery which, through its branches, supplies the whole body.

These valves are little folds of membrane which allow the blood to go in one direction, but which close like one-way folding doors against the return flow—like the valves in a pump. In valvular disease a valve does not open completely, thereby obstructing the flow of blood (valvular obstruction or stenosis), or else it does not close completely, thereby allowing a return flow of blood (valvular insufficiency). Sometimes both conditions are present, a valve being so damaged that it can neither open nor close completely.

The vast majority of valvular diseases are the result of endocarditis, an inflammation of the lining membrane of the heart which occurs generally in rheumatic fever, or acute articular rheumatism, as it was formerly called, and occasionally in muscular rheumatism. Other diseases, such as diphtheria, typhoid, cerebro-spinal meningitis, whooping cough, influenza and other germ diseases, may cause endocarditis and valvular disease, but rheumatism is responsible for most cases.

We know now that what used to be called growing pains in children is really rheumatism, and this generally produces endocarditis and sometimes valvular disease. This valvular disease may be so slight that it does not seriously interfere with circulation, and the person may go through life without knowing that the heart is affected, or he may learn of it when he is examined for life insurance.

The most common valvular disease, mitral insufficiency, is due, in the vast majority of cases, to an endocarditis occurring during rheumatism in childhood. Each of the four valves can be so diseased that it will either obstruct the flow or allow a return flow, and thus there are eight distinct valvular diseases.

A valve may be both stenosed and incompetent and often two or more valves are diseased at the same time. When people speak of a leaking heart they mean a valvular insufficiency, some of the blood leaking back through the incompletely closed valve. Mitral insufficiency forms about 50 per cent of valvular diseases, aortic insufficiency about 30 per cent, mitral stenosis about 15 per cent, aortic stenosis nearly 5 per cent, while the tricuspid and pulmonary valve diseases form less than 1 per cent.

The reason these diseases are often neglected or overlooked is that the earliest symptoms usually do not refer to the heart. In mitral insufficiency there is a shortness of breath and the patient imagines he has asthma or some other form of lung trouble. A patient may have this for years before palpitation and paleness with bluish lips and finger nails lead him to suspect heart trouble.

In mitral stenosis there may be no symptoms for years after the signs are discovered. (Symptoms are what the patient experiences, such as palpitation, pain, cough, fainting etc.; signs are what the physician discovers, such as murmurs, changes in the character of the pulse, in blood pressure, etc.). In aortic insufficiency the early symptoms are usually headache, ringing in the ears and dizziness.

Patients having these symptoms treat themselves for years for indigestion and never suspect the real cause of these symptoms. In this disease there is occasionally pain in the heart, either a dull ache or an occasional stitch. This, of course, will attract attention to the heart, but where this symptom is absent the usual early symptoms are misinterpreted until palpitation, shortness of breath and lividness on exertion appear. In aortic stenosis there may be no symptom for many years, or only symptoms of anemia of the brain though occasionally there is a dull ache about the heart.

The most important sign which tells the physician that there is a valvular disease is the murmur, a peculiar sound which accompanies the ordinary sounds of the heart. The location of the murmur tells him which valve is affected, and the time when it occurs, whether with, before or after the rst sound of the heart, tells him whether it is an obstruction or an insufficiency of that valve.

There are other features about the murmur, such as the character, length, direction in which it is carried, that help to establish the diagnosis, but location and time are the important and determining ones. Murmurs are sometimes heard in the chest which are not caused by valvular diseases. These murmurs can be heard months or years before there are any symptoms of heart disease, but sometimes the murmur is so faint that only a very sensitive ear can detect it through the stethoscope. Occasionally no murmur can be heard and the heart sounds appear perfectly normal, or the murmur disappears for a few beats or minutes or for hours or days.

A valve disease may exist for years without giving the slightest symptom which would attract attention to the heart. A little extra exertion as in running, or a sudden strain as in jumping, or even swinging a golf stick, will suffice to tear through the damaged valve by sending a mass of blood against it with greater force than it can stand. If it is the mitral valve the next contraction of the ventricle sends part of the blood back into the fast-filling auricle.

If it is the aortic valve, the next contraction of the aorta sends a mass of blood back into the fast-filling ventricle. The auricle sends between five and six ounces of blood into the ventricle at each contraction, the contraction lasting about one-fifth or one-sixth of a second. The ventricle sends the same quantity into the aorta, the contraction period lasting about two-fifths or one-third of a second.

The heart is very adaptable and it can gradually develop increased force and speed and permit greater stretching of its walls, but it cannot adapt itself to the sudden stretching of the walls of a cavity.

If, during the one-sixth of a second that the ventricle is filling, a mass of blood is sent back by the contracting aorta, the sudden stretching of the ventricle will cause a paralysis of the heart. This paralysis is sudden and complete. The normal pulse rate, which corresponds to the heart rate, is about seventy-five beats a minute; in other words, the heart sends out five or six ounces of blood every four-fifths of a second. The rapidity of flow in the carotid artery, the large artery which can be felt pulsating in the side of the neck, is twenty and four-fifths inches a second; and the time required for blood to reach the brain from the heart is about three-fourths of a second.

The contraction of the aorta which sent the paralyzing mass of blood back into the heart also sent a part of the blood to the brain. In three-fourths of a second after paralysis of the heart occurs a diminishing amount of blood reaches the brain, causing sudden anemia and fainting. In a small fraction of a second this blood is on its way back to the heart, and when four-fifths of a second later a fresh supply from the heart is not forthcoming the brain becomes paralyzed and death ensues. Thus death would occur in about one and one-half seconds after the paralysis of the heart.

It might occur in half that time if the contraction of the aorta sends most of the blood back to the heart and only a very small amount reaches the brain. In the strict scientific sense there is no such thing as instant death, for there is a measurable interval between the cause of death and the actual extinguishing of life.

Paralysis of the brain is said to cause instant death, but as nerve impulses travel 111 feet a second it takes the one-twentieth part of a second before all the nerves in the body stop functioning. Even then parts of the body may be alive, in the sense that they can act as if alive, for a short time; until the blood is so changed that it can no longer supply these parts with nutrition. In the usually accepted sense, death ensues when the brain stops functioning, and as a result all other functions of the body cease.

All valvular diseases do not end in sudden, unexpected death; in fact, this result is infrequent. In the vast majority of cases symptoms of heart disease which the patient recognizes develop gradually—the shortness of breath becomes worse, palpitation upon exertion, and later without exertion, occurs frequently; the skin becomes sallow and in advanced cases livid; there are occasional fainting spells, a persistent heart cough, sometimes a constant ache or an occasional stitch in the heart.

As the natural result of an obstruction to the flow or a return of part of the flow would be a lessened supply of blood in the circulation, the heart acts with greater force to send a greater supply. Its walls become thicker, producing hypertrophy or enlargement of the heart. This keeps up for an indefinite period, then the walls, instead of continuing to grow in thickness, stretch, thereby increasing the cavities. The cavities are now dilated and the walls become thinner and weaker. This dilatation of the heart is an extremely dangerous condition, produces very active symptoms, and usually ends in paralysis of the heart.

There are a number of diseases of the heart besides valvular diseases which end fatally, and a few which give no dangerous symptoms before the final end.

There are several other forms of degeneration of the heart, but these are very rare and they do not differ in their symptoms and signs from fatty degeneration.

Some cannot be recognized during life, but are found on autopsy after death. Dilatation of the heart, which is really a degeneration, as the heart muscle is changed, is sometimes rapidly fatal.

The introduction of the sphygmomanometer, by which the blood pressure is determined, and the very elaborate and complicated recording instruments, the electrocardiograph, sphygmograph, the polygraph and the micrograph, which record the movements of the heart, have opened a new field in the study of heart diseases. The important practical point, however, is not so much the recording of abnormal movements of the heart, as the discovery of abnormal heart conditions which may cause death, yet give no symptoms of their presence.

Had Mrs. Gould been examined from time to time such abnormal condition which led to her untimely death might have been found.